**IN THE UNITED STATES DISTRICT COURT**
**FOR THE NORTHERN DISTRICT OF OKLAHOMA**

| | | |
|---|---|---|
| **STATE OF OKLAHOMA, *et al.*,** | ) | |
| | ) | |
| ***Plaintiffs*,** | ) | |
| | ) | |
| **v.** | ) | **Case No. 4:05-cv-00329-GKF-PJC** |
| | ) | |
| **TYSON FOODS, INC., *et al.*,** | ) | |
| | ) | |
| ***Defendants*.** | ) | |
| | ) | |

**DECLARATION OF DR. CHARLES COWAN**

1. My name is Charles Cowan. I am Managing Partner of Analytic Focus, LLC. I hold a PhD in mathematical statistics from the George Washington University.

2. I have been retained by the Defendants in this matter to provide testimony relating to the use of statistics and statistical models. Specifically, I was retained to review and report on the statistical analysis performed, or failure to perform statistical analysis, by Plaintiffs' experts Dr. Roger Olsen and Dr. Valerie Harwood. On December 1, 2008, my expert report was served on the Plaintiffs in this matter. That report, which I understand is attached to Defendants' Opposition to Plaintiffs' motion to exclude my testimony reflects the testimony I will provide if called to testify at trial. I incorporate that testimony here by reference.

3. I have reviewed the State of Oklahoma's Motion in Limine to Preclude Expert Testimony of Defendants' Witness Charles Cowan, Ph.D., Dkt. No. 2072 (May 18, 2009). I have also reviewed the State of Oklahoma's Response to Defendants' Motion to Exclude the Testimony of Dr. Valerie J. Harwood pursuant to *Daubert v. Merrell Pharmaceuticals*, Dkt. No. 2115 (May 26, 2009).

4. In support of their motion to exclude my testimony, Plaintiffs offer a declaration from Dr. Rick Chappell, a consultant who apparently worked with Dr. Olsen in preparing his expert report, but who was not himself disclosed as an expert witness. Specifically, it appears that Dr. Chappell was in large part responsible for generating the principal component analysis data runs that underlie Dr. Roger Olsen's testimony claiming to have identified a "poultry specific biomarker." Dr. Chappell, therefore, undertook some or all of the work that is the focus of my report. Dr. Chappell's declaration adds detail to Dr. Olsen's report and prior testimony regarding the procedures they followed in conducting their principal component analysis. I was not privy to Dr. Chappell's opinions and testimony prior to preparing my report. Nevertheless, Dr. Chappell's declaration does not change my conclusions. In fact, Dr. Chappell does not explain away any of my

criticisms regarding Dr. Olsen's analysis. In the following paragraphs, I highlight that in particular he does not explain the issues related to how data in the constructed database differs from data in the subset databases that were analyzed. These latter, Dr. Olsen's subset databases were what I analyzed (Dr. Chappell is wrong in his opinion on that), but as a researcher I should be able to start with the full database and create the subsets analyzed. I cannot because the data differs between the full dataset and the subsets.

5. Dr. Olsen's considered materials produced along with his report in this case included several relevant databases and excel files. First, Plaintiffs maintained their full dataset in a Microsoft Access database referred to as the Illinois Master database. The datasets that underlie each of Dr. Olsen's PCA runs are maintained in individual Microsoft Excel spreadsheets. There are in fact 20 versions of the Illinois Master database, each successive one adding and in some cases deleting records from prior databases. The Illinois Master databases and most of the individual run Excel spreadsheets were produced to Defendants. This included Dr. Olsen's SW3 dataset, which is named "Crosstab_Water_0427_SW_3.xls" as part of his work papers. Dr. Olsen's considered materials also included Excel files containing the PC scores resulting from his SW3 run ("Results_Water_0427_SW_3.xls") and his "scatter plot" resulting from SW3 ("PC_Plot_Water_0427_SW_3.xls").

6. In my report I criticize the manner in which Dr. Olsen compiled the datasets that underlie his PCA runs. Specifically, I explained that Dr. Olsen's SW3 run cannot be recreated fully and accurately simply by pulling data directly from any one of the many files labeled "Illinois Master Database" in the manner that Dr. Olsen describes in his Report.

7. Part of the difficulty in recreating Dr. Olsen's dataset is caused by the fact that he, without explanation or notice, often changes the names used for his samples between datasets. It is extremely unusual for a scientist to change sample names between datasets as it makes it difficult for him to reproduce his own results, yet Dr. Olsen makes such changes frequently.

   For example, the following screenshot shows several samples in the Illinois Master Database.

ample

| Samplek | B_Indexky | FlowCond | COCID | SampleGrp_old | SampleGrp |
|---|---|---|---|---|---|
| 118863 | | BFC | CDMI02507 | 07195500 : 10/15/2007 : 22 : | 07195500:10/15/2007:SW:S:-:- |
| 117408 | | BFC | 348197 | 07195500 : 10/15/2007 : 22 : | 07195500:10/15/2007:SW:S:-:- |
| 118217 | | BFC | | 07195500 : 10/15/2007 : 22 : | 07195500:10/15/2007:SW:S:-:- |
| 113668 | | BFC | | 07195500 : 10/19/2005 : 22 : | 07195500:10/19/2005:SW:S:-:- |
| 117296 | | BFC | | 07195500 : 10/2/2006 : 22 : | 07195500:10/2/2006:SW:S:-:USGS1 |
| 114651 | | BFC | 252060 | 07195500 : 10/2/2006 : 22 : | 07195500:10/2/2006:SW:S:-:USGS1 |
| 115718 | | BFC | CDMI04306 | 07195500 : 10/2/2006 : 22 : | 07195500:10/2/2006:SW:S:-:USGS1 |
| 115719 | | BFC | CDMI04306 | 07195500 : 10/2/2006 : 22 : | 07195500:10/2/2006:SW:S:-:USGS2 |

In the SW3 database, the first three samples, dated 10/15/2007, have been averaged and renamed "USGS-07195500:10/15/2007:SW:S:-:-." The last four samples, dated 10/2/2006 were averaged and renamed "USGS-07195500:10/2/2006:SW:S:-:-." We

were able to identify and relate these samples back to the Access database only by patient, manual detective work. These are but two of many examples of sample names that were modified by the removal of spaces between words, the removal or addition of prefixes or suffices, or the reordering of the components of the sample name. This makes recreating a dataset laborious and time consuming as often times one cannot simply search for the sample by its name. This is not consistent with quality data management practices.

8. The difficulty in recreating SW3 is also caused by the fact that for a number of samples, the data changes between the Illinois Master database and the SW3 file. For example, in the master database, Total Coliform data are recorded under "Paramky 68" (Parameter Key), and Enterococcus Group data are recorded under "Paramky 103." In Appendix F to his report, Dr. Olsen lists by sample group all of the data used in his SW3 run. One of those sample group names is "BS-08:8/23/2005:SW:S:-:-." When we look in Dr. Olsen's separately produced SW3 data, we find that this sample group contains data for both Coliform and Enterococcus, as shown on the following chart.

| Names | COLIFORMS | CU_T | ECOLI | ENTERO |
|---|---|---|---|---|
| BS-08:8/23/2005:SW:S:-:- | 1000 | 0.0005 | . | 0.5 |

However, when we take the sample group IDs and search for them in the Illinois Master database, the results indicate no data for Coliforms or Enterococcus, as shown on the following chart.

| Paramaky | 68 | 69 | 100 | 103 |
|---|---|---|---|---|
| Names | COLIFORMS | CU_T | ECOLI | ENTERO |
| BS-08:8/23/2005:SW:S:-:- | No Value | 0.0005 | | No Value |

Each sample group combines data from multiple samples and tests. Sample group "BS-08:8/23/2005:SW:S:-:-." includes data associated with five different "sample keys" as shown on the following screenshot: SampleKeys 105025, 105178, 105179, 106374, and 106848

| Samplek | B_Indexky | FlowCond | COCID | SampleGrp_old | SampleGrp |
|---|---|---|---|---|---|
| 106729 | | | | BS-08 : 8/23/2005 : 15 : | BS-08:8/23/2005:SD:S:-:- |
| 106373 | | | 1095 | BS-08 : 8/23/2005 : 15 : | BS-08:8/23/2005:SD:S:-:- |
| 105025 | | BFC | CDM001-09 | BS-08 : 8/23/2005 : 22 : | BS-08:8/23/2005:SW:S:-:- |
| 105178 | | BFC | 05-238-0202 | BS-08 : 8/23/2005 : 22 : | BS-08:8/23/2005:SW:S:-:- |
| 105179 | | BFC | 05-238-0202 | BS-08 : 8/23/2005 : 22 : | BS-08:8/23/2005:SW:S:-:- |
| 106374 | | BFC | 1095 | BS-08 : 8/23/2005 : 22 : | BS-08:8/23/2005:SW:S:-:- |
| 106848 | | BFC | GA-2005-20-11 | BS-08 : 8/23/2005 : 22 : | BS-08:8/23/2005:SW:S:-:- |
| 117922 | | | | BS-08 : 8/24/2005 : 26 : | BS-08:8/24/2005:BN:S:-:- |

In order to find the data associated with each individual sample, it is necessary to run the individual Sample Keys through the "LabResult Table" in the master database. We did so for each of the individual sample keys associated with "BS-08:8/23/2005:SW:S:-:-." We found that indeed there is no Coliform or Enterococcus data associated with any of these, as shown on the following screenshots.

LabResult data for Sampleky 105025. Note that there entry for any data for Paramky 68 (Total Coliform) or Paramky 103 (Enterococcus Group).

| LabResu | Sampleky | Paramky | ValOp | Value_txt | Value |
|---|---|---|---|---|---|
| 49633 | 105032 | 105 | < | ND(1) | 1 |
| 49634 | 105025 | 144 | = | 0.01809951403 | 0.018099514 |
| 49635 | 105025 | 143 | = | 0.01873209920 | 0.018732099 |
| 49636 | 105025 | 149 | = | 0.02067760048 | 0.020677600 |
| 49637 | 105033 | 94 | = | 82.3 | 82.3 |
| 49638 | 105033 | 95 | = | 80.3 | 80.3 |

LabResult data for Sampleky 105178. Notice there are no 68 or 103 Paramky values.

| LabResu | Sampleky | Paramky | ValOp | Value_txt | Value | Fin_ |
|---|---|---|---|---|---|---|
| 51873 | 105179 | 89 | < | ND(0.005) | 0.005 | |
| 51874 | 105178 | 4 | = | 98 | 98 | |
| 51875 | 105178 | 8 | = | 6.53 | 6.53 | |
| 51876 | 105178 | 12 | < | ND(0.01) | 0.01 | |
| 51877 | 105178 | 13 | < | ND(0.001) | 0.001 | |
| 51878 | 105178 | 14 | < | ND(0.001) | 0.001 | |
| 51879 | 105178 | 15 | = | 0.045 | 0.045 | |
| 51880 | 105178 | 16 | < | ND(0.001) | 0.001 | |
| 51881 | 105178 | 17 | < | ND(0.001) | 0.001 | |
| 51882 | 105178 | 18 | = | 46.33 | 46.33 | |
| 51883 | 105178 | 19 | < | ND(0.001) | 0.001 | |
| 51884 | 105178 | 20 | < | ND(0.001) | 0.001 | |
| 51885 | 105178 | 21 | = | 0.001 | 0.001 | |
| 51886 | 105178 | 22 | = | 0.026 | 0.026 | |
| 51887 | 105178 | 23 | < | ND(0.001) | 0.001 | |
| 51888 | 105178 | 24 | = | 1.686 | 1.686 | |
| 51889 | 105178 | 25 | = | 0.005 | 0.005 | |
| 51890 | 105178 | 26 | < | ND(0.005) | 0.005 | |
| 51891 | 105178 | 27 | = | 0.002 | 0.002 | |
| 51892 | 105178 | 142 | < | ND(0.025) | 0.025 | |
| 51893 | 105178 | 140 | = | 0.055 | 0.055 | |
| 51894 | 105178 | 30 | = | 2.316 | 2.316 | |
| 51895 | 105178 | 31 | < | ND(0.001) | 0.001 | |
| 51896 | 105178 | 32 | < | ND(0.001) | 0.001 | |
| 51897 | 105178 | 33 | = | 4.023 | 4.023 | |
| 51898 | 105178 | 34 | < | ND(0.001) | 0.001 | |
| 51899 | 105178 | 35 | = | 0.001 | 0.001 | |
| 51900 | 105178 | 36 | = | 0.007 | 0.007 | |
| 51901 | 105178 | 151 | < | ND(0.0002) | 0.0002 | |
| 51902 | 105178 | 141 | = | 0.031 | 0.031 | |
| 51903 | 105178 | 85 | = | 6.14 | 6.14 | |
| 51904 | 105181 | 42 | = | 0.601 | 0.601 | |

LabResult data for Sampleky 105179. Notice there are no 68 or 103 Paramky values.

| LabResu | Sampleky | Paramky | ValOp | Value_txt | Value | Fin |
|---|---|---|---|---|---|---|
| 51841 | 105182 | 85 | = | 27.05 | 27.05 | |
| 51842 | 105179 | 42 | = | 0.134 | 0.134 | |
| 51843 | 105179 | 148 | < | ND(0.025) | 0.025 | |
| 51844 | 105179 | 58 | < | ND(1) | 1 | |
| 51845 | 105179 | 59 | = | 0.014 | 0.014 | |
| 51846 | 105179 | 60 | < | ND(0.001) | 0.001 | |
| 51847 | 105179 | 61 | < | ND(0.001) | 0.001 | |
| 51848 | 105179 | 62 | = | 0.044 | 0.044 | |
| 51849 | 105179 | 63 | < | ND(0.001) | 0.001 | |
| 51850 | 105179 | 64 | < | ND(0.001) | 0.001 | |
| 51851 | 105179 | 65 | = | 44.309 | 44.309 | |
| 51852 | 105179 | 66 | < | ND(0.001) | 0.001 | |
| 51853 | 105179 | 67 | < | ND(0.001) | 0.001 | |
| 51854 | 105179 | 69 | < | ND(0.001) | 0.001 | |
| 51855 | 105179 | 71 | = | 143 | 143 | |
| 51856 | 105179 | 72 | = | 0.027 | 0.027 | |
| 51857 | 105179 | 73 | = | 2.5 | 2.5 | |
| 51858 | 105179 | 74 | < | ND(0.001) | 0.001 | |
| 51859 | 105179 | 75 | = | 1.805 | 1.805 | |
| 51860 | 105179 | 76 | = | 0.005 | 0.005 | |
| 51861 | 105179 | 77 | < | ND(0.0002) | 0.0002 | |
| 51862 | 105179 | 78 | < | ND(0.005) | 0.005 | |
| 51863 | 105179 | 79 | < | ND(0.001) | 0.001 | |
| 51864 | 105179 | 147 | < | ND(0.025) | 0.025 | |
| 51865 | 105179 | 146 | = | 0.041 | 0.041 | |
| 51866 | 105179 | 81 | = | 2.151 | 2.151 | |
| 51867 | 105179 | 82 | < | ND(0.001) | 0.001 | |
| 51868 | 105179 | 83 | < | ND(0.001) | 0.001 | |
| 51869 | 105179 | 84 | = | 3.821 | 3.821 | |
| 51870 | 105179 | 86 | < | ND(2) | 2 | |
| 51871 | 105179 | 87 | < | ND(0.001) | 0.001 | |
| 51872 | 105179 | 88 | < | ND(0.001) | 0.001 | |
| 51873 | 105179 | 89 | < | ND(0.005) | 0.005 | |
| 51874 | 105178 | 4 | = | 98 | 98 | |

LabResult data for Sampleky 1068374. Notice there are no 68 or 103 Paramky values.

| LabResu | Sampleky | Paramky | ValOp | Value_txt | Value | Fin |
|---|---|---|---|---|---|---|
| 68319 | 106373 | 109 | = | 220 | 220 | |
| 68320 | 106374 | 39 | = | 68 | 68 | |
| 68321 | 106374 | 56 | = | 800 | 800 | |
| 68322 | 106374 | 98 | < | ND(1) | 1 | |
| 68323 | 106374 | 99 | = | 1000 | 1000 | |
| 68324 | 106374 | 102 | < | ND(1) | 1 | |
| 68325 | 106374 | 107 | < | ND(1) | 1 | |
| 68326 | 106374 | 109 | = | 30 | 30 | |
| 68327 | 106375 | 39 | < | ND(0.22) | 0.22 | |

LabResult data for Sampleky 106848. Notice there are no 68 or 103 Paramky values.

| LabResu | Sampleky | Paramky | ValOp | Value_txt | Value | Fin_ |
|---|---|---|---|---|---|---|
| 69146 | 106847 | 95 | < | ND(10) | 10 | |
| 69147 | 106848 | 95 | = | 4.65 | 4.65 | |
| 69148 | 106848 | 104 | < | ND(1) | 1 | |
| 69149 | 106848 | 96 | = | 205 | 205 | |
| 69150 | 106848 | 105 | < | ND(1) | 1 | |
| 69151 | 106848 | 94 | < | ND(1) | 1 | |
| 69152 | 106849 | 94 | < | ND(1) | 1 | |

9. Because there is no data for Total Coliform or Enterococcus associated with any of these individual sample keys, there is no such data associated with Sample Group "BS-08:8/23/2005:SW:S:-:-." Therefore, when we attempted to recreate Dr. Olsen's SW3 dataset using the information provided in his Report, specifically the Sample Group IDs, we turned up no Total Coliform or Enterococcus data for this sample group. Yet, Dr. Olsen's separately produced SW3 database does contain such data, as shown above. Yet, we have no way of knowing where the 1000 and .5 value in the SW3 data came from.

10. Similar examples follow from another part of the data provided to us. In the screenshots that follow, we have all the sample keys that are part of one sample, and we combine the data to come up with values in our attempt to replicate SW3. We fail, however, for no discernable reason since we have uniquely identified any sample key that was part of the named sample below.

11. The samplekys from the sample table for Sample_Grp EOF-SPREAD048:5/9/2006:SW:S:-:- are 107684, 107685, 109797, 11293, 113359, and 118486.

| Samplek | B_Indexky | FlowCond | COCID | SampleGrp_old | SampleGrp |
|---|---|---|---|---|---|
| 107686 | | NA | 06-135-0209 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:FS:-:- |
| 109797 | | NA | CDM00139 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 107685 | | NA | 06-135-0209 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 112293 | | NA | 219573 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 113359 | | NA | CDMI01306 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 107684 | | NA | 06-135-0209 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 118486 | | NA | Dataset 1 | EOF-SPREAD048 : 5/9/2006 : 22 : | EOF-SPREAD048:5/9/2006:SW:S:-:- |
| 108469 | | NA | 216665 | EOF-SPREAD052 : 4/25/2006 : 22 : | EOF-SPREAD052:4/25/2006:SW:S:-:- |

**SW3 data.**

| EDA Sample | AL_T | ALKALINITY | AS_T | BA_T |
|---|---|---|---|---|
| EOF-SPREAD048:5/9/2006:SW:S:-:- | 1.331 | 62 | 0.002 | 0.058 |
| EOF-SPREAD052:4/25/2006:SW:S:-:- | 3.6 | 74 | 0.003 | 0.088 |
| EOF-SPREAD053B:5/4/2006:SW:S:-:- | 0.784 | 62 | 0.003 | 0.048 |
| EOF-SPREAD053E:4/29/2006:SW:S:-:- | 1.9 | 160 | 0.039 | 0.106 |

**Analytic Focus data. <u>Notice Paramky values are 59 and 4.</u>**

| Names | AL_T | ALKALINITY | AS_T | BA_T |
|---|---|---|---|---|
| Paramaky | 59 | 4 | 61 | 62 |
| EOF-SPREAD048:5/9/2006:SW:S:-:- | 0.782 | 60 | 0.002 | 0.053 |
| EOF-SPREAD052:4/25/2006:SW:S:-:- | 3.6 | 74 | 0.003 | 0.088 |
| EOF-SPREAD053B:5/4/2006:SW:S:-:- | 0.784 | 62 | 0.003 | 0.048 |
| EOF-SPREAD053E:4/29/2006:SW:S:-:- | 1.9 | 160 | 0.039 | 0.106 |

LabResult for Sampleky 107684. Value for 4 is 60 and value for 59 is missing.

| LabResu | Sampleky | Param | Val | Value_txt | Value | Fin_ |
|---|---|---|---|---|---|---|
| 80785 | 107683 | 89 | = | 0.043 | 0.043 | |
| 80692 | 107684 | 4 | = | 60 | 60 | |
| 80693 | 107684 | 8 | = | 6.93 | 6.93 | |
| 80694 | 107684 | 12 | = | 0.148 | 0.148 | |
| 80695 | 107684 | 13 | < | ND(0.001) | 0.001 | |
| 80696 | 107684 | 14 | = | 0.002 | 0.002 | |
| 80697 | 107684 | 15 | = | 0.047 | 0.047 | |
| 80698 | 107684 | 16 | < | ND(0.001) | 0.001 | |
| 80699 | 107684 | 17 | < | ND(0.001) | 0.001 | |
| 80700 | 107684 | 18 | = | 18.5 | 18.5 | |
| 80701 | 107684 | 19 | < | ND(0.001) | 0.001 | |
| 80702 | 107684 | 20 | < | ND(0.001) | 0.001 | |
| 80703 | 107684 | 21 | = | 0.006 | 0.006 | |
| 80704 | 107684 | 22 | = | 0.313 | 0.313 | |
| 80705 | 107684 | 23 | < | ND(0.001) | 0.001 | |
| 80706 | 107684 | 24 | = | 2.13 | 2.13 | |
| 80707 | 107684 | 25 | = | 0.004 | 0.004 | |
| 80708 | 107684 | 151 | < | ND(0.0002) | 0.0002 | |
| 80709 | 107684 | 26 | < | ND(0.005) | 0.005 | |
| 80710 | 107684 | 27 | = | 0.001 | 0.001 | |
| 80711 | 107684 | 140 | = | 1.14 | 1.14 | |
| 80712 | 107684 | 30 | = | 15.9 | 15.9 | |
| 80713 | 107684 | 31 | < | ND(0.001) | 0.001 | |
| 80714 | 107684 | 32 | < | ND(0.001) | 0.001 | |
| 80715 | 107684 | 33 | = | 3.75 | 3.75 | |
| 80716 | 107684 | 34 | < | ND(0.001) | 0.001 | |
| 80717 | 107684 | 35 | < | ND(0.01) | 0.01 | |
| 80718 | 107684 | 36 | = | 0.007 | 0.007 | |
| 80719 | 107684 | 85 | = | 9.8 | 9.8 | |
| 81211 | 107685 | 5 | = | 0.384 | 0.384 | |

LabResult for Sampleky 107685. Value for 4 is missing and value for 59 is .782.

| LabResu | Sampleky | Param | Val | Value_txt | Value | Fin |
|---|---|---|---|---|---|---|
| 80719 | 107684 | 85 | = | 9.8 | 9.8 | |
| 81211 | 107685 | 5 | = | 0.384 | 0.384 | |
| 81212 | 107685 | 11 | = | 0.166 | 0.166 | |
| 81213 | 107685 | 42 | = | 0.35 | 0.35 | |
| 81214 | 107685 | 47 | = | 6.4 | 6.4 | |
| 81215 | 107685 | 58 | = | 16.9 | 16.9 | |
| 81216 | 107685 | 59 | = | 0.782 | 0.782 | |
| 81217 | 107685 | 60 | < | ND(0.001) | 0.001 | |
| 81218 | 107685 | 61 | = | 0.002 | 0.002 | |
| 81219 | 107685 | 62 | = | 0.053 | 0.053 | |
| 81220 | 107685 | 63 | < | ND(0.001) | 0.001 | |
| 81221 | 107685 | 64 | < | ND(0.001) | 0.001 | |
| 81222 | 107685 | 65 | = | 19.1 | 19.1 | |
| 81223 | 107685 | 66 | < | ND(0.001) | 0.001 | |
| 81224 | 107685 | 67 | < | ND(0.001) | 0.001 | |
| 81225 | 107685 | 69 | = | 0.005 | 0.005 | |
| 81226 | 107685 | 71 | = | 122 | 122 | |
| 81227 | 107685 | 72 | = | 1.05 | 1.05 | |
| 81228 | 107685 | 73 | = | 3.6 | 3.6 | |
| 81229 | 107685 | 74 | < | ND(0.001) | 0.001 | |
| 81230 | 107685 | 75 | = | 2.3 | 2.3 | |
| 81231 | 107685 | 76 | = | 0.045 | 0.045 | |
| 81232 | 107685 | 77 | < | ND(0.0002) | 0.0002 | |
| 81233 | 107685 | 78 | < | ND(0.005) | 0.005 | |
| 81234 | 107685 | 79 | = | 0.002 | 0.002 | |
| 81235 | 107685 | 146 | = | 1.42 | 1.42 | |
| 81236 | 107685 | 81 | = | 18.1 | 18.1 | |
| 81237 | 107685 | 82 | < | ND(0.001) | 0.001 | |
| 81238 | 107685 | 83 | < | ND(0.001) | 0.001 | |
| 81239 | 107685 | 84 | = | 3.85 | 3.85 | |
| 81240 | 107685 | 86 | = | 14 | 14 | |
| 81241 | 107685 | 87 | < | ND(0.001) | 0.001 | |
| 81242 | 107685 | 88 | < | ND(0.01) | 0.01 | |
| 81243 | 107685 | 89 | = | 0.012 | 0.012 | |
| 79897 | 107686 | 18 | = | 19.7 | 19.7 | |

LabResult for Sampleky 109796 value for 4 is missing and value for 59 is missing.

| LabResu | Sampleky | Param | Val | Value_txt | Value |
|---|---|---|---|---|---|
| 96844 | 109796 | 149 | = | 0.982 | 0.982 |
| 96845 | 109797 | 143 | = | 1.33 | 1.33 |
| 96846 | 109797 | 149 | = | 1.53 | 1.53 |
| 96847 | 109797 | 144 | = | 1.23 | 1.23 |
| 96848 | 109798 | 149 | = | 2.32 | 2.32 |

LabResult for Sampleky 112293 value for 4 is missing and value for 59 is missing.

| LabResu | Sampleky | Param | Val | Value_txt | Value |
|---|---|---|---|---|---|
| 117722 | 112292 | 108 | < | ND(2) | 2 |
| 117723 | 112293 | 39 | = | 140000 | 140000 |
| 117724 | 112293 | 56 | < | ND(2) | 2 |
| 117725 | 112293 | 68 | = | 400000 | 400000 |
| 117726 | 112293 | 97 | < | ND(2) | 2 |
| 117727 | 112293 | 100 | = | 140000 | 140000 |
| 117728 | 112293 | 103 | = | 180000 | 180000 |
| 117729 | 112293 | 108 | < | ND(2) | 2 |
| 117730 | 112294 | 39 | = | 4600 | 4600 |

LabResult for Sampleky 113359 value for 4 is missing and value for 59 is missing.

| LabResu | Sampleky | Param | Val | Value_txt | Value |
|---|---|---|---|---|---|
| 120240 | 113358 | 105 | < | ND(5) | 5 |
| 120241 | 113359 | 94 | < | ND(5) | 5 |
| 120242 | 113359 | 95 | < | ND(5) | 5 |
| 120243 | 113359 | 96 | = | 20.8 | 20.8 |
| 120244 | 113359 | 104 | < | ND(5) | 5 |
| 120245 | 113359 | 105 | < | ND(5) | 5 |
| 120246 | 113360 | 94 | < | ND(5) | 5 |

LabResult for Sampleky 118486 value for 4 is missing and value for 59 is missing.

| LabResu | Sampleky | Param | Val | Value_txt | Value |
|---|---|---|---|---|---|
| 155373 | 118485 | 283 | < | BDL | |
| 155374 | 118486 | 283 | < | BDL | |
| 155375 | 118487 | 283 | = | 966047.38549 | 966047 |

12. There was only one value for AL_T (Paramaky 59) and one value for ALKALINITY (Paramaky 4). The values were .782 and 60, which are the values in the Analytic Focus data. The SW3 data has the values 1.331 and 62.

13. Thus, either Dr. Olsen drew his data from somewhere other than Plaintiffs produced database, or the data is filed under some other sample key or sample group that Dr. Olsen has never identified, or he simply made it up. Whatever the answer, this manner of data manipulation and transfer is not consistent with quality data management practices and renders Dr. Olsen's work very difficult, if not impossible, to reproduce.

I declare under penalty of perjury that the foregoing is true and correct.

Executed, June 5, 2009.

Charles Cowan, Ph.D.